

AutoRead® Handheld Device / Programmer

Standard Model - AR 5501 RadioRead™ Model - AR 5502

APPLICATION — METER READING:

The Sensus AutoRead® Hand-Held Device [HHD] is primarily designed to collect and store utility meter readings with built-in capability for expanded uses. The HHD interfaces to a personal computer [PC] through a communications/charging stand used for uploading pre-programmed meter reading route information. The computer must be equipped with Sensus AutoRead® System software.

The Model AR-5501 accepts meter reading data entered manually on a built-in keypad, or electronically, through TouchRead® System reading guns used for interrogating encoders. Reading gun options include cable-connected and RF (no cable required) styles.

The Model AR-5502 includes all features of the Model AR-5501, plus it can read Sensus RadioRead® Meter Transceiver Units [MXUs].



SPECIFICATIONS

PROGRAMMING:

The AR5500 series HHDs are designed for collecting meter readings as well as programming RadioRead MXUs, FlexNet SmartPoints, and ICE registers.

CONSTRUCTION:

The HHD is housed in a weather-resistant, high impact, UV-stabilized plastic. Surface-mounted circuitry in the specially designed, watertight case allows the HHD to be used in rugged field conditions over a wide range of temperatures.

ERGONOMIC DESIGN:

The HHD's ergonomic-minded design offers a well-balanced, easy-to-handle unit. It includes a graphical liquid crystal display [LCD] for ease of viewing during operation. The contrast value of the LCD automatically adjusts based on the ambient temperature, but can also be easily field adjusted to compensate for use in varying lighting conditions. The HHD can be manually carried during operation, or function in the optional HHD carrier harness.

BACKLIGHTING:

A backlight feature provides illumination to the LCD for convenience in data entry and ease of reading data in areas with insufficient lighting.

PRIMARY	Hand-held electronic meter reading collection and data storage device for manual, TouchRead System, and RadioRead meter reading.
OPTIONAL	Programmer for Sensus SmartPoints and ICE registers
PHYSICAL CHARACTERISTICS	Case material molded of high impact, UV-stabilized plastic. Orange color standard. Reading device/programmer connection built in. Carrying harness included.
DIMENSIONS	10" [254 mm] (H) x 5.25" [133.35 mm] (W) at display and 3.1" [78.74 mm] (W) at its narrowest point x 2.75" [69.85 mm] deep and 1.5" [38.1 mm] at its shallowest
WEIGHT	29.5 oz (836 grams)
OPERATING SYSTEM	Microsoft Windows Mobile 6 Microprocessor: Intel XScale® processor, 624 MHz Operating Memory: 128 MB SDRAM Data Storage Memory: 1GB
KEYPAD	Alpha and numeric. Large keys can be operated while wearing gloves
DISPLAY	Backlit color LED screen. Will display meter reading information, route information from hand-held, and any additional system information.
POWER SUPPLY	Lithium Ion batteries, field replaceable battery packs maintain functionality of up to 1,500 touch type or RadioReads (AR5002 only) readings for at least 12 hours
OPERATING TEMPERATURE	-22° F to 130° F (-30° to 54° C)
HOUSING	Tested to withstand being dropped on any surface from a 4 foot height without damage. Tested to MIL-STD 810F and IP67 for waterproof, dustproof, and shockproof (drop) standards.
READING COMPATIBILITY	Able to read Sensus encoders, Sensus MultiRead Modules, Badger ADE and Neptune Proread (ARB VI).
COMMUNICATIONS/CHARGING STAND	Holds one HHD per stand. Microprocessor controlled. Load/Unload speed: 115k Baud Communications Interface: Serial RS 232C Bluetooth® Class I approved Certifications: FCC Class B, CE, Rotts Compliant, EN60950

FLEXIBLE DATA ENTRY:

When used with a Sensus TouchRead AutoGun, the HHD automates the reading process. Reading data from Sensus and compatible absolute encoder equipped meters is obtained and stored in the HHD. Manual entries can also be made using the keypad, which features elastomeric, tactile response keys. Preprogrammed "high" and "low" range limits, calculated and passed from the utility billing software, can be sent to alert the user of possible reading errors. In addition, the Model AR 5502 provides expanded features for reading and programming Sensus RadioRead MXUs.

CORDLESS AUTOGUN:

Used in conjunction with the AutoRead HHD, the cordless AutoGun provides the ability to perform TouchRead readings without the need for cables from the AutoGun to the AutoRead HHD. Information is stored in the AutoRead HHD through a bi-directional, low-power RF link.

AUTOMATIC, ERROR-FREE DATA COLLECTION:

When used with a TouchRead AutoGun, the HHD collects and stores readings automatically from Sensus or compatible absolute encoders. Regardless of the route sequence programmed into memory, the HHD software identifies each meter encoder using the encoder's internal identification number. The software then searches the route program and automatically stores the meter reading in the correct customer account. When the utility's meter readers hear an audible alert tone from the HHD, it is alerting them to a special condition or hazard. They need only refer to instructions on the HHD screen on how to proceed. This process eliminates errors and increases meter reading speed.

AUDIBLE VERIFICATION/WARNING:

The audible tone confirms completed TouchRead and RadioRead System readings or alerts the user to faulty or out-of-limit readings. Tones can also be programmed with notes to alert the meter reader to hazardous situations or to respond to field survey questions.

COMMENTS/NOTES:

The HHD uses preprogrammed, utility-defined note codes, or free form notes [using the alpha and numeric keypad].

Meter readers can identify accounts requiring special attention, or they can note unusual conditions and account survey information.

REPLACEABLE BATTERY:

The rechargeable, self-contained Lithium Ion battery pack is field-replaceable to minimize downtime. The HHD is also equipped with a lithium battery backup to maintain date and time.

PRODUCTIVITY MONITORING:

The HHD's built-in clock can record the time and day of each meter reading. The software can note and store the type of reading made: manual, automatic, and/or multiple data entry. These reads provide an overview of time spent reading the route and special problems related to readings or equipment use.

SERVICE AND WARRANTY:

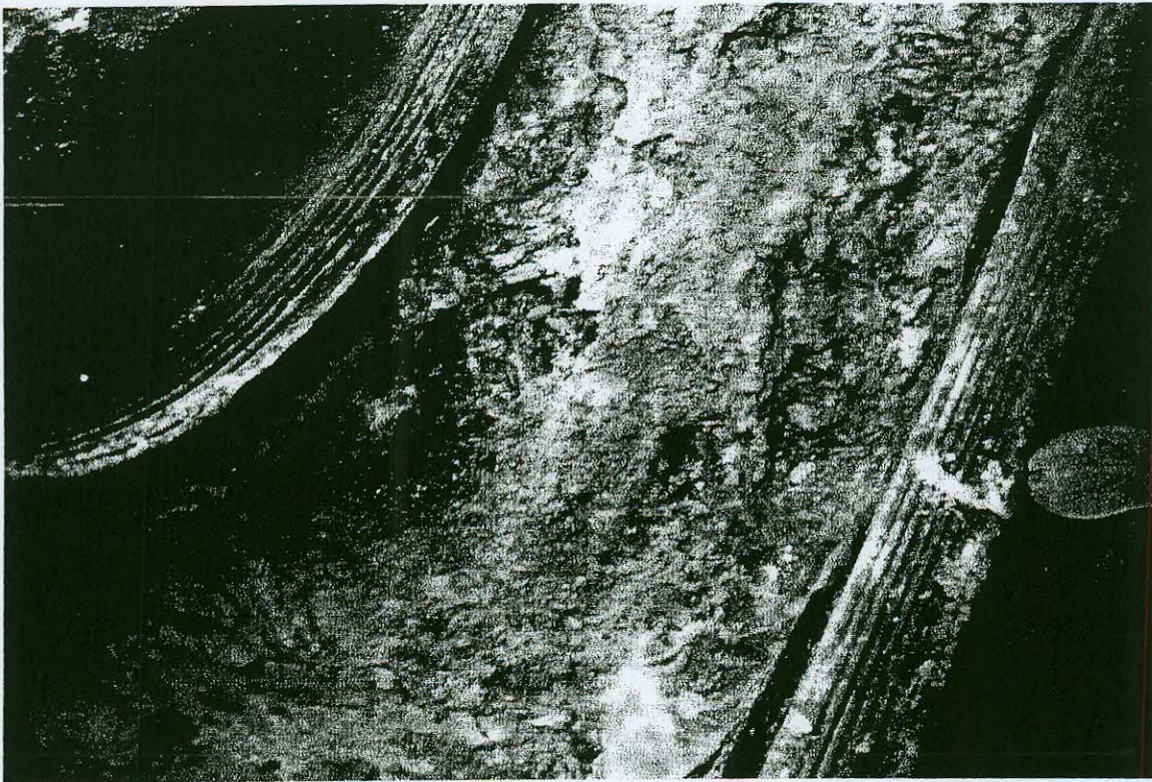
No service should be necessary if reasonable care is given during normal use. Sensus offers the Sensus Equipment Maintenance Program [SEMP] to extend the protection of HHDs and related equipment beyond the one [1] year warranty covering materials and workmanship. Warranty and service policy details are available from Sensus representatives and authorized AMR distributors.

TouchRead AutoGun or AutoGun PitProbe can be used with the HHD for electronic reading of meters equipped with TouchRead System encoders: AutoGun reading gun and PitProbe extension can be used without a connecting cord.

The Sensus 5500 Series HHD provides flexibility for utilities needing a reliable electronic hand-held meter reading and programming device. In addition to accepting meter readings via its keypad, the HHD also accepts readings from TouchRead® System and RadioRead® System equipped meters where those systems are used.



6 VALVES originally installed in 1927



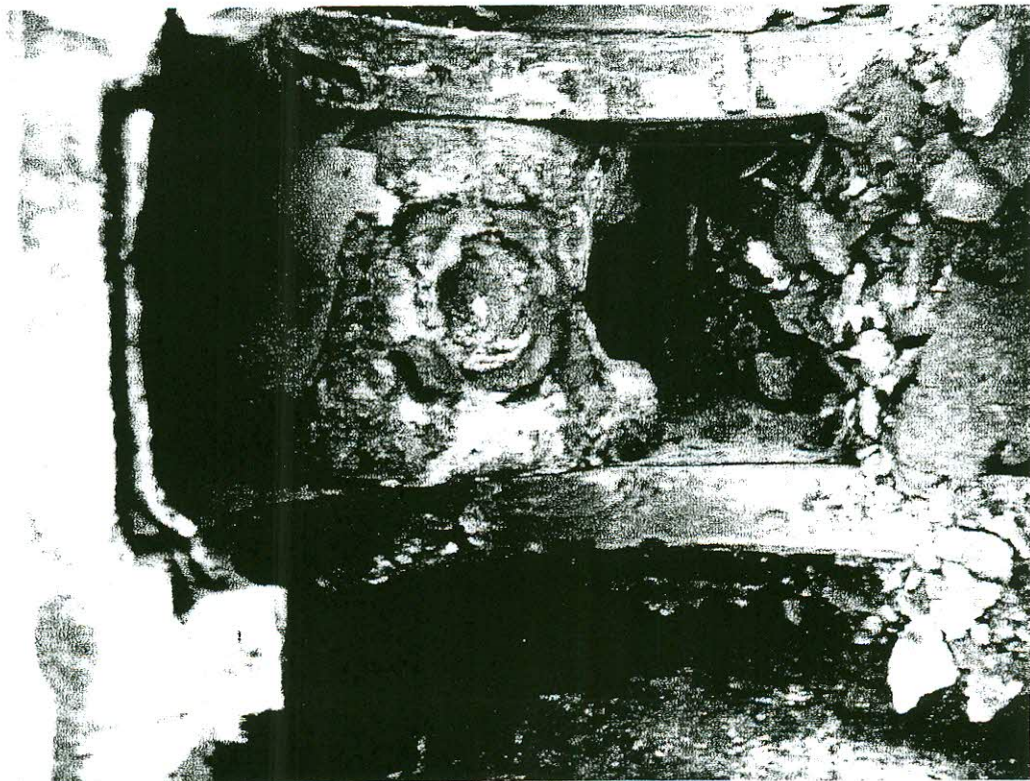
VALVE SEAT



Hole in Valve Body



VALVE CUT OPEN



Valve Blade



Draper Aden Associates

Engineering • Surveying • Environmental Services

The 23rd Annual Virginia Water and Wastewater Rate Report 2011



Virginia Section

A Division of the American Water Works Association

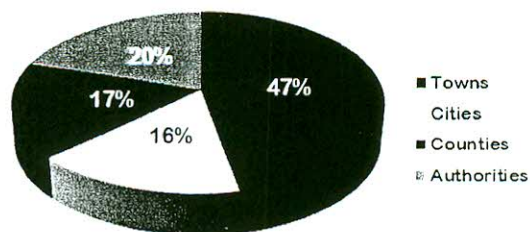


24

The 2011 Survey

The data and summaries offered in this report are the result of 67% of those surveyed (268) choosing to participate in our annual survey. The responses are from municipal water and wastewater providers made up of towns, cities, counties and authorities.

Response Breakdown



Rates rarely, if ever, decrease and once again, as nearly every year of survey results have reflected, the average charges and fees have risen overall. Water and wastewater providers face a variety of economic challenges in recovering existing and future costs of operation. We provide this survey and subsequent report free of charge as a useful tool for analysis as utility providers struggle with the issue of "how much should we charge" for water and wastewater.

This year our special section looked at administrative costs and miscellaneous fees. Participants were asked to respond to a variety of questions focused on those fees charged to offset expenses incurred in the billing process of providing water and wastewater services.

Our interactive Rate Dashboard, created in partnership with the EPA's Environmental Finance Center at UNC-Chapel Hill, is located at www.daa.com.

Abbreviations & Terms

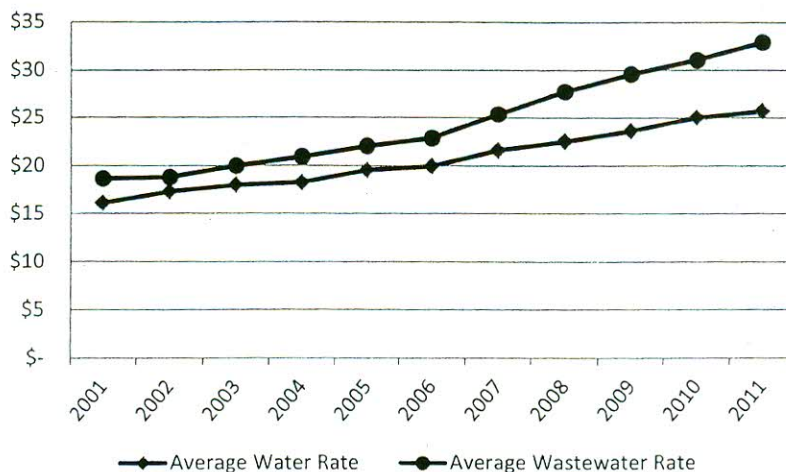
B/C/I = Business/Commercial/Industrial
In = Inside Municipal Boundaries
Out = Outside Municipal Boundaries

Control Group Data

Our control group is comprised of twenty (20) water and wastewater providers who represent a cross section of utilities across the Commonwealth and who have faithfully participated in the survey for the past 16 years. The information below is reflective of responses from this group. The rates shown reflect residential charges based on consumption of 5,000 gallons per month.

The average monthly residential water rate increased \$0.70 or 2.8% from last year. Over the past decade water rates have risen \$9.61 or 59.7%.

The average monthly residential wastewater rate increased \$1.85 or 6% during the same time period. Since 2001, wastewater rates have risen \$14.25 or 76.5%.



	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Average Water Rate	\$16.09	\$17.28	\$17.97	\$18.25	\$19.52	\$19.94	\$21.59	\$22.50	\$23.58	\$25.00	\$25.70
Average Wastewater Rate	\$18.63	\$18.77	\$19.96	\$20.91	\$22.01	\$22.83	\$25.32	\$27.74	\$29.56	\$31.03	\$32.88

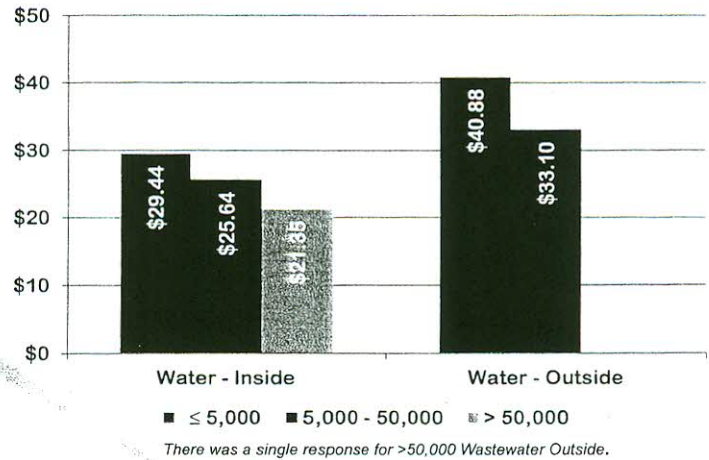
Water and Wastewater Rate Trends

Survey participants were asked to provide information concerning the monthly residential water bill based on consumption of 5,000 gallons of water (or 670 cubic feet) per month and to "include all water and wastewater-related charges that are included on the customer's bill such as account service fees, billing fees, debt service fees, rehab fees, etc." Since some providers charge higher rates for customers outside the municipal boundaries, the survey instrument provided an opportunity to list both the inside and outside rates. In instances where participants entered the same fee for both charges, only the inside municipal boundaries fee is reported herein and included in our calculations.

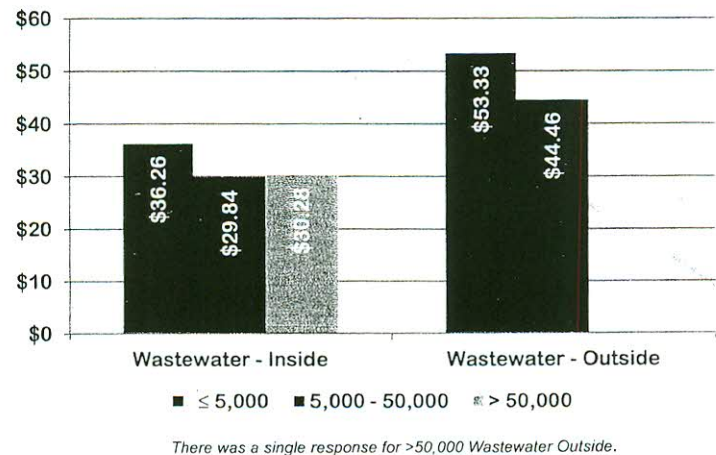
Summary

Water Rate Summary	Replies	Avg.	Median
Residential Connections	174	10,283	1,748
Non-residential Connections	173	698	164
Monthly Residential Rate (In) per 5,000 gallons	177	\$28.14	\$26.46
Monthly Residential Rate (Out) per 5,000 gallons	81	\$39.64	\$38.00
Monthly B/C/I Rate per 1 million gallons (In)	152	\$4,613	\$4,014

By System Size

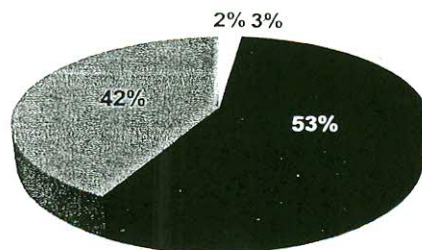


Wastewater Rate Summary	Replies	Avg.	Median
Residential Connections	161	9,892	1,575
Non-residential Connections	158	766	167
Monthly Residential Rate (In) per 5,000 gallons	164	\$34.30	\$34.12
Monthly Residential Rate (Out) per 5,000 gallons	64	\$51.48	\$45.39
Monthly B/C/I Rate per 1 million gallons (In)	142	\$5,845	\$5,147



Last Rate Change

Sixty-seven percent (67%) of water providers and 74% of wastewater utilities adjusted rates during 2010 or 2011. Only nine water providers and four wastewater utilities have not changed rates since 2005.



Pre 2000
 ■ 2000 - 2005
 ■ 2006 - 2010
 ■ 2011

